SOLAR/1038-79/03

Monthly Performance Report

SADDLE HILL TRUST

LOT 36

MARCH 1979

U.S. Department of Energy

National Solar Heating and Cooling Demonstration Program

National Solar Data Program

MONTHLY PERFORMANCE REPORT

SADDLE HILL TRUST
LOT 36

MARCH 1979

I. SYSTEM DESCRIPTION

Saddle Hill Trust Lot 36 is a single-family residence in Medway, Massachusetts. Solar energy is used for space heating the home and preheating domestic hot water (DHW). The system has an array of flat-plate collectors with a gross area of 315 square feet. The array faces south at an angle of 58 degrees to the horizontal. A 60 percent glycerol solution is the transfer medium that delivers solar energy from the collector array to storage; water is the transfer medium that delivers solar energy from storage to the space heating and hot water loads. Solar energy is stored in the basement in a 750-gallon storage tank. The tank is made of steel and lined with polyurethane. Preheated city water is supplied, on demand, to a conventional 80-gallon DHW tank. When solar energy is insufficient to satisfy the space heating load, an oil furnace provides auxiliary energy for space heating. Similarly, a conventional electric 80-gallon DHW heater provides auxiliary energy for water heating. The system, shown schematically in Figure 1, has three modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when the collector temperature is either more than 40°F higher than storage temperature or higher than 150°F. Pump P1 is on. Solar energy transfer takes place through a heat exchanger located inside the storage tank.

Mode 2 - Storage-to-Space Heating: This mode activates when there is a demand for space heating, storage temperature is 70°F or higher, and house temperature is lower than storage temperature. Pump P3 is on. Solar energy transfer takes place through a heat exchanger located inside the air duct.

Mode 3 - Storage-to-DHW Tank: This mode activates when storage water is 5°F higher than water in the DHW tank. Pump P2 is on. Solar energy transfer takes place through a heat exchanger located inside the DHW heater.

II. PERFORMANCE EVALUATION

INTRODUCTION

The site was occupied in March and the solar energy system operated continuously during the month. Solar energy satisfied 67 percent of the DHW requirements and 25 percent of the space heating requirements. The solar energy system provided electrical energy savings of 2.2 million Btu and fossil fuel energy savings of 3.1 million Btu.

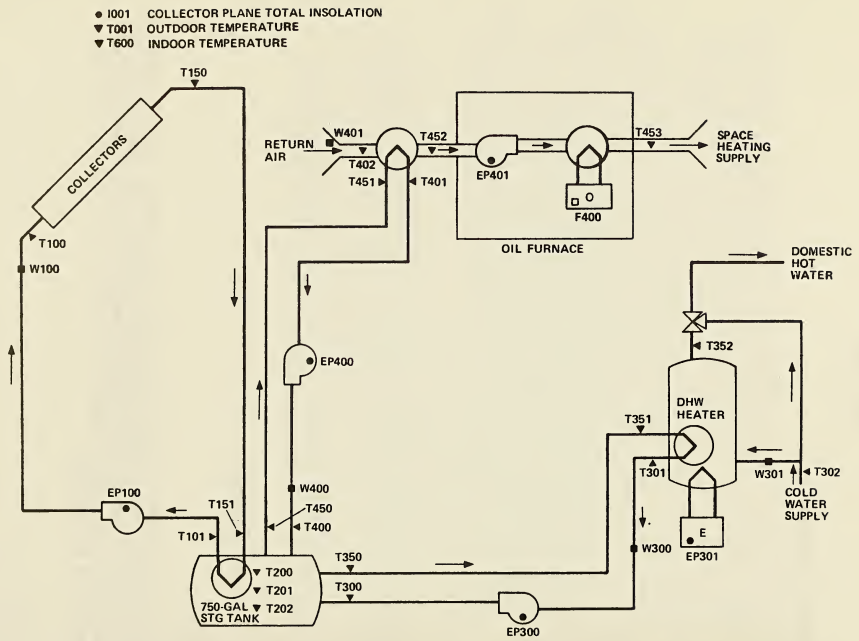

Figure 1. SADDLE HILL TRUST, LOT NO. 36, SOLAR ENERGY SYSTEM SCHEMATIC

WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 11.4 million Btu for a daily average of 1168 Btu per square foot. This was below the estimated average daily solar radiation for this geographical area during March of 1198 Btu per square foot for a south-facing plane with a tilt of 58 degrees to the horizontal. The average ambient temperature during March was 41°F as compared with the long-term average for March of 38°F. The number of heating degree-days for the month (based on a 65°F reference) was 751, as compared with the long-term average of 834.

THERMAL PERFORMANCE

System - During March the solar energy system performed somewhat poorer than expected. The expected performance was determined from a modified f-chart analysis, using measured weather and subsystem loads as inputs. Solar energy collected was 4.5 million Btu versus an estimated 5.7 million Btu. Solar energy used by the system was estimated by assuming that all energy collected would be applied to the load. Actual solar energy used was 4.3 million Btu. System total solar fraction was 32 percent versus an estimated 53 percent.

Collector - The total incident solar radiation on the collector array for the month of March was 11.4 million Btu. During the period the collector loop was operating, the total insolation amounted to 9.0 million Btu. The total collected solar energy for the month of March was 4.5 million Btu, resulting in a collector array efficiency of 39 percent, based on total incident insolation. Solar energy delivered from the collector array to storage was 4.5 million Btu. Operating energy required by the collector loop was 0.090 million Btu.

Storage - Solar energy delivered to storage was 4.5 million Btu. There were 4.3 million Btu delivered from storage to the DHW and space heating subsystems. Energy loss from storage was 0.33 million Btu. This loss represented 7 percent of the energy delivered to storage. The storage efficiency was 93 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 114°F.

DHW Load - The DHW subsystem consumed 2.5 million Btu of solar energy and 1.1 million Btu of auxiliary electrical energy to satisfy a hot water load of 1.3 million Btu. The solar fraction of this load was 67 percent. Losses from the DHW subsystem were 2.3 million Btu. The DHW subsystem consumed a total of 0.18 million Btu of operating energy, resulting in an electrical energy savings of 2.3 million Btu. A daily average of 51 gallons of DHW was consumed at an average temperature of 139°F delivered from the tank.

Space Heating Load - The space heating subsystem consumed 1.8 million Btu of solar energy and 8.9 million Btu of auxiliary fossil fuel energy to satisfy a space heating load of 7.2 million Btu. The solar fraction of this load was 25 percent. The space heating subsystem consumed a total of 2.5 million Btu of operating energy, resulting in an electrical energy expense of 0.033 million Btu and a fossil fuel energy savings of 3.1.

OBSERVATIONS

The DHW loop pump was on continuously throughout the month and was a prime contributor to the 2.3 million Btu energy loss in the DHW subsystem.

ENERGY SAVINGS

The DHW subsystem provided an electrical energy savings of 2.3 million Btu. The space heating subsystem incurred an electrical energy expense of 0.033 million Btu and provided a fossil fuel energy savings of 3.1 million Btu.

III. ACTION STATUS

Boeing has been in contact with the system designer. The designer was planning to investigate DHW subsystem operation.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA SOLAR/1024-79/03
REPORT PERIOD: MARCH,1979

SITE/SYSTEM DESCRIPTION:
THE SADDLE HILL TRUST LOT #36 SOLAR ENERGY SYSTEM PROVIDES SPACE HEATING AND HOT WATER FOR A SINGLE FAMILY RESIDENCE. THE COLLECTOR IS A 14 PANEL LIQUID COLLECTOR. STORAGE IS A 750 GALLON WATER TANK LOCATED IN THE BASEMENT. AUXILIARY HEATING IS PROVIDED BY A 140,000 BTU/HR OIL FURNACE AND AUXILIARY HOT WATER BY A 14,676 BTU/HR ELECTRIC DOMESTIC HOT WATER HEATER.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	11.406 MILLION BTU
	36211 BTU/SQ.FT.
COLLECTED SOLAR ENERGY	4.467 MILLION BTU
	14182 BTU/SQ.FT.
AVERAGE AMBIENT TEMPERATURE	41 DEGREES F
AVERAGE BUILDING TEMPERATURE	69 DEGREES F
ECSS SOLAR CONVERSION EFFICIENCY	0.38
ECSS OPERATING ENERGY	0.090 MILLION BTU
TOTAL SYSTEM OPERATING ENERGY	2.730 MILLION BTU
TOTAL ENERGY CONSUMED	17.216 MILLION BTU

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	1.319	7.180	N.A.	8.499 MILLION BTU
SOLAR FRACTION	67	25	N.A.	32 PERCENT
SOLAR ENERGY USED	2.494	1.831	N.A.	4.324 MILLION BTU
OPERATING ENERGY	0.179	2.461	N.A.	2.730 MILLION BTU
AUX. THERMAL ENERGY	1.103	5.349	N.A.	6.452 MILLION BTU
AUX. ELECTRIC FUEL	1.103	N.A.	N.A.	1.103 MILLION BTU
AUX. FOSSIL FUEL	N.A.	8.915	N.A.	8.915 MILLION BTU
ELECTRICAL SAVINGS	2.314	-0.033	N.A.	2.192 MILLION BTU
FOSSIL SAVINGS	N.A.	3.051	N.A.	3.051 MILLION BTU

SYSTEM PERFORMANCE FACTOR: 0.392

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM, FEBRUARY 28, 1978, SOLAR/0004-78/18

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SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA SOLAR/1024-79/03
REPORT PERIOD: MARCH,1979

SITE/SYSTEM DESCRIPTION:
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GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	12.034	GIGA JOULES
	411207	KJ/SQ.M.
COLLECTED SOLAR ENERGY	4.713	GIGA JOULES
	161049	KJ/SQ.M.
AVERAGE AMBIENT TEMPERATURE	5	DEGREES C
AVERAGE BUILDING TEMPERATURE	20	DEGREES C
ECSS SOLAR CONVERSION EFFICIENCY	0.38	
ECSS OPERATING ENERGY	0.095	GIGA JOULES
TOTAL SYSTEM OPERATING ENERGY	2.880	GIGA JOULES
TOTAL ENERGY CONSUMED	18.163	GIGA JOULES

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	1.392	7.575	N.A.	8.967 GIGA JOULES
SOLAR FRACTION	67	25	N.A.	32 PERCENT
SOLAR ENERGY USED	2.631	1.931	N.A.	4.562 GIGA JOULES
OPERATING ENERGY	0.189	2.596	N.A.	2.880 GIGA JOULES
AUX. THERMAL ENG	1.164	5.643	N.A.	6.807 GIGA JOULES
AUX. ELECTRIC FUEL	1.164	N.A.	N.A.	1.164 GIGA JOULES
AUX. FOSSIL FUEL	N.A.	9.406	N.A.	9.406 GIGA JOULES
ELECTRICAL SAVINGS	2.442	-0.035	N.A.	2.312 GIGA JOULES
FOSSIL SAVINGS	N.A.	3.219	N.A.	3.219 GIGA JOULES

SYSTEM PERFORMANCE FACTOR: 0.392

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SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA
REPORT PERIOD: MARCH,1979

SOLAR/1024-79/03

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TO LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	0.379	39	0.204	N	0.004	N	0.538
2	0.070	37	0.088	O	0.000	O	1.248
3	0.222	39	0.044	T	0.003	T	0.197
4	0.166	40	0.041		0.002		0.246
5	0.266	54	0.067	A	0.003	A	0.250
6	0.047	50	0.048	P	0.000	P	1.019
7	0.039	43	0.056	P	0.000	P	1.442
8	0.118	42	0.032	L	0.001	L	0.274
9	0.536	42	0.079	I	0.004	I	0.147
10	0.056	39	0.054	C	0.000	C	0.961
11	0.080	35	0.061	A	0.000	A	0.760
12	0.496	25	0.076	B	0.005	B	0.154
13	0.468	32	0.151	L	0.005	L	0.322
14	0.125	47	0.065	E	0.000	E	0.523
15	0.708	24	0.193		0.006		0.272
16	0.616	23	0.276		0.005		0.448
17	0.716	33	0.190		0.005		0.265
18	0.468	32	0.323		0.003		0.691
19	0.329	40	0.099		0.004		0.299
20	0.646	43	0.179		0.005		0.278
21	0.412	48	0.224		0.003		0.543
22	0.718	54	0.160		0.006		0.223
23	0.691	54	0.186		0.005		0.270
24	0.434	52	0.157		0.003		0.361
25	0.062	51	0.120		0.000		1.942
26	0.666	42	0.204		0.005		0.305
27	0.738	32	0.407		0.005		0.551
28	0.741	36	0.193		0.005		0.260
29	0.139	42	0.240		0.000		1.733
30	0.078	46	0.067		0.000		0.857
31	0.176	47	0.042		0.002		0.241
SUM	11.406	-	4.324	N.A.	0.090	N.A.	-
AVG	0.368	41	0.139	N.A.	0.003	N.A.	0.379
NBS ID	Q001	N113			Q102		N111

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
COLLECTOR ARRAY PERFORMANCE

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA SOLAR/1024-79/03
REPORT PERIOD: MARCH,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	DAYTIME AMBIENT TEMP DEG F	COLLECTOR ARRAY EFFICIENCY
1	0.379	0.300	0.147	54	0.387
2	0.070	0.000	0.000	39	0.000
3	0.222	0.150	0.066	46	0.298
4	0.166	0.082	0.035	44	0.213
5	0.266	0.204	0.110	62	0.412
6	0.047	0.000	0.000	52	0.000
7	0.039	0.000	0.000	43	0.000
8	0.118	0.012	0.010	44	0.083
9	0.536	0.493	0.282	48	0.526
10	0.056	0.000	0.000	42	0.000
11	0.080	0.000	0.000	37	0.000
12	0.496	0.418	0.183	30	0.369
13	0.468	0.379	0.172	37	0.367
14	0.125	0.024	0.009	53	0.073
15	0.708	0.645	0.306	25	0.432
16	0.616	0.539	0.254	27	0.412
17	0.716	0.642	0.324	42	0.452
18	0.468	0.358	0.177	38	0.379
19	0.329	0.270	0.123	49	0.374
20	0.646	0.564	0.306	49	0.474
21	0.412	0.350	0.177	57	0.429
22	0.718	0.655	0.363	68	0.505
23	0.691	0.596	0.310	71	0.449
24	0.434	0.295	0.123	63	0.284
25	0.062	0.000	0.000	53	0.000
26	0.666	0.597	0.286	50	0.430
27	0.738	0.647	0.305	37	0.413
28	0.741	0.663	0.334	42	0.450
29	0.139	0.017	0.013	44	0.092
30	0.078	0.000	0.000	49	0.000
31	0.176	0.107	0.053	50	0.302
SUM	11.406	9.009	4.467	-	-
AVG	0.368	0.291	0.144	47	0.392
NBSID	Q001		Q100		N100

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
STORAGE PERFORMANCE

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA SOLAR/1024-79/03
REPORT PERIOD: MARCH,1979

DAY OF MONTH	ENERGY TO STORAGE MILLICN BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
1	0.149	0.204	-0.051	118	1.029
2	0.000	0.088	-0.101	106	1.000
3	0.072	0.044	-0.004	97	0.562
4	0.036	0.041	-0.012	97	0.805
5	0.111	0.067	0.035	100	0.914
6	0.000	0.048	-0.042	99	1.000
7	0.000	0.056	-0.043	91	1.000
8	0.005	0.032	-0.021	86	2.133
9	0.289	0.079	0.167	97	0.853
10	0.000	0.054	-0.049	109	1.000
11	0.000	0.061	-0.054	100	1.000
12	0.180	0.076	0.076	103	0.848
13	0.165	0.151	0.012	110	0.987
14	0.010	0.065	-0.050	105	1.479
15	0.299	0.193	0.083	113	0.923
16	0.256	0.276	-0.019	117	1.004
17	0.325	0.190	0.101	126	0.893
18	0.178	0.323	-0.118	118	1.154
19	0.122	0.099	0.012	111	0.908
20	0.298	0.179	0.095	123	0.921
21	0.182	0.224	-0.039	120	1.017
22	0.365	0.160	0.148	132	0.844
23	0.307	0.186	0.076	151	0.853
24	0.125	0.157	-0.053	152	0.829
25	0.000	0.120	-0.111	141	1.000
26	0.288	0.204	0.059	137	0.914
27	0.307	0.407	-0.092	131	1.027
28	0.336	0.193	0.096	130	0.858
29	0.010	0.240	-0.198	120	4.161
30	0.000	0.067	-0.070	103	1.000
31	0.058	0.042	-0.009	95	0.574
SUM	4.474	4.324	-0.175	-	-
AVG	0.144	0.139	-0.006	114	0.928
NBS ID	Q200	Q201	Q202		N108

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL CATA.
N.A. DENOTES NOT APPLICABLE CATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
HOT WATER SUBSYSTEM

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA
REPORT PERIOD: MARCH, 1979

SOLAR/1024-79/03

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR.OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	SUP. WAT. TEMP DEG F	HOT WAT. TEMP DEG F	HOT WATER USED GAL
1	0.062	69	0.114	0.006	0.040	0.040	N	0.108	N	45	142	74
2	0.032	65	0.068	0.006	0.047	0.047	O	0.062	O	44	142	37
3	0.054	55	0.044	0.006	0.042	0.042	T	0.038	T	48	142	64
4	0.026	51	0.041	0.006	0.039	0.039		0.035		44	140	31
5	0.044	53	0.067	0.006	0.050	0.050	A	0.061	A	48	136	52
6	0.042	53	0.048	0.006	0.050	0.050	P	0.042	P	47	143	50
7	0.056	47	0.056	0.006	0.070	0.070	P	0.050	P	46	143	67
8	0.036	40	0.032	0.006	0.055	0.055	L	0.027	L	43	144	41
9	0.049	43	0.079	0.006	0.071	0.071	I	0.073	I	43	144	58
10	0.041	59	0.054	0.006	0.036	0.036	C	0.048	C	51	133	50
11	0.062	56	0.061	0.006	0.055	0.055	A	0.055	A	45	142	76
12	0.055	56	0.076	0.006	0.051	0.051	B	0.071	B	46	145	65
13	0.064	63	0.088	0.006	0.048	0.048	L	0.082	L	53	139	77
14	0.028	60	0.065	0.006	0.047	0.047	E	0.059	E	48	140	33
15	0.034	63	0.052	0.006	0.024	0.024		0.047		46	143	41
16	0.072	72	0.114	0.006	0.037	0.037		0.109		47	140	90
17	0.024	81	0.084	0.006	0.010	0.010		0.078		49	133	30
18	0.044	73	0.078	0.006	0.024	0.024		0.073		56	126	56
19	0.035	66	0.078	0.006	0.044	0.044		0.072		54	132	42
20	0.011	76	0.092	0.006	0.029	0.029		0.086		52	128	14
21	0.031	77	0.100	0.006	0.035	0.035		0.094		47	139	38
22	0.029	82	0.099	0.006	0.015	0.015		0.093		47	142	35
23	0.047	96	0.145	0.006	0.003	0.003		0.139		52	136	57
24	0.034	99	0.087	0.006	0.000	0.000		0.081		44	150	39
25	0.036	99	0.120	0.006	0.005	0.005		0.114		47	142	46
26	0.064	91	0.132	0.006	0.012	0.012		0.126		50	141	78
27	0.054	89	0.134	0.006	0.017	0.017		0.128		48	139	68
28	0.022	85	0.096	0.006	0.021	0.021		0.090		51	136	28
29	0.046	80	0.080	0.006	0.027	0.027		0.074		49	141	56
30	0.036	62	0.067	0.006	0.051	0.051		0.061		48	142	44
31	0.047	47	0.042	0.005	0.048	0.048		0.037		54	128	58
SUM	1.319	-	2.494	0.179	1.103	1.103	N.A.	2.314	N.A.	-	-	1596
AVG	0.043	67	0.080	0.006	0.036	0.036	N.A.	0.075	N.A.	48	139	51
NBS	Q302	N300	Q300	Q303	Q301	Q305	Q306	Q311	Q313	N305	N307	N308

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SPACE HEATING SUBSYSTEM

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA
REPORT PERIOD: MARCH, 1979

SOLAR/1024-79/03

DAY OF MON.	SPACE HEATING LOAD MILLION BTU	SOLAR FR.OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDG TEMP DEG. F	AMB TEMP DEG. F
1	0.173	52	0.090	0.084	0.083	N	0.139	-0.002	0.150	68	39
2	0.272	7	0.020	0.077	0.253	O	0.421	-0.000	0.033	66	37
3	0.295	0	0.000	0.072	0.295	T	0.491	0.000	0.000	70	39
4	0.303	0	0.000	0.073	0.303		0.505	0.000	0.000	69	40
5	0.081	0	0.000	0.020	0.081	A	0.135	0.000	0.000	70	54
6	0.105	0	0.000	0.027	0.105	P	0.176	0.000	0.000	70	50
7	0.200	0	0.000	0.051	0.200	P	0.334	0.000	0.000	70	43
8	0.208	0	0.000	0.052	0.208	L	0.347	0.000	0.000	69	42
9	0.178	0	0.000	0.041	0.178	I	0.296	0.000	0.000	68	42
10	0.307	0	0.000	0.074	0.307	C	0.512	0.000	0.000	68	39
11	0.288	0	0.000	0.067	0.288	A	0.480	0.000	0.000	69	35
12	0.536	0	0.000	0.130	0.536	B	0.893	0.000	0.000	69	25
13	0.387	16	0.063	0.128	0.324	L	0.541	-0.001	0.105	69	32
14	0.247	0	0.000	0.061	0.247	E	0.412	0.000	0.000	69	47
15	0.416	34	0.140	0.155	0.276		0.460	-0.003	0.234	69	24
16	0.456	35	0.161	0.177	0.295		0.491	-0.003	0.269	68	23
17	0.324	33	0.106	0.106	0.218		0.363	-0.001	0.176	70	33
18	0.463	53	0.245	0.215	0.218		0.363	-0.005	0.408	70	32
19	0.262	8	0.021	0.077	0.241		0.402	-0.000	0.034	70	40
20	0.235	37	0.087	0.084	0.148		0.246	-0.001	0.145	69	43
21	0.184	68	0.124	0.103	0.060		0.100	-0.002	0.207	70	48
22	0.111	55	0.061	0.063	0.050		0.083	-0.001	0.101	71	54
23	0.062	66	0.041	0.023	0.021		0.035	-0.001	0.068	70	54
24	0.070	100	0.070	0.030	0.000		0.000	-0.001	0.116	69	52
25	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	68	51
26	0.090	80	0.072	0.038	0.018		0.030	-0.001	0.120	67	42
27	0.302	90	0.273	0.173	0.029		0.049	-0.005	0.455	68	32
28	0.197	49	0.096	0.093	0.130		0.167	-0.002	0.161	67	36
29	0.208	77	0.161	0.116	0.047		0.078	-0.003	0.268	67	42
30	0.090	0	0.000	0.022	0.090		0.150	0.000	0.000	67	46
31	0.129	0	0.000	0.031	0.129		0.215	0.000	0.000	66	47
SUM	7.180	-	1.831	2.461	5.349	N.A.	8.915	-0.033	3.051	-	-
AVG	0.232	25	0.059	0.079	0.173	N.A.	0.288	-0.001	0.098	69	41
NBS	Q402	N400	Q400	Q403	Q401		Q410	Q415	Q417	N406	N1 13

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SPACE COOLING SUBSYSTEM

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA
REPORT PERIOD: MARCH,1979

SOLAR/1024-79/03

DAY OF MON.	SPACE COOLING LOAD MILLION BTU	SOLAR FR.OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDG DRY BULB TEMP F	AMB TEMP DEG F
1	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	68	39
2										66	37
3										70	39
4										69	40
5										70	54
6										70	50
7										70	43
8										59	42
9										68	42
10										68	39
11										69	35
12										69	25
13										69	32
14										69	47
15										69	24
16										68	23
17										70	33
18										70	32
19										70	40
20										69	43
21										70	48
22										71	54
23										70	54
24										69	52
25										68	51
26										67	42
27										68	32
28										67	36
29										67	42
30										67	46
31										66	47
SUM	N.A.	-	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	-	-
AVG	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	69	41
NBS	Q502	N500	Q500	Q503	Q501		Q508	Q512	Q514	N406	N113

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SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENVIRONMENTAL SUMMARY

SITE: SADDLE HILL TRUST LOT 36, MEDWAY, MA
REPORT PERIOD: MARCH,1979

SOLAR/1024-79/03

DAY OF MONTH	TOTAL INSOLATION BTU/SQ.FT	DIFFUSE INSOLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	DAYTIME AMBIENT TEMP DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.
1	1205	N	39	54	N	N	N
2	223	O	37	39	O	O	O
3	705	T	39	46	T	T	T
4	528		40	44			
5	845	A	54	62	A	A	A
6	151	P	50	52	P	P	P
7	124	P	43	43	P	P	P
8	376	L	42	44	L	L	L
9	1703	I	42	48	I	I	I
10	177	C	39	42	C	C	C
11	254	A	35	37	A	A	A
12	1576	B	25	30	B	B	B
13	1485	L	32	37	L	L	L
14	396	E	47	53	E	E	E
15	2249		24	25			
16	1956		23	27			
17	2272		33	42			
18	1485		32	38			
19	1045		40	49			
20	2049		43	49			
21	1308		48	57			
22	2278		54	68			
23	2193		54	71			
24	1377		52	63			
25	196		51	53			
26	2114		42	50			
27	2344		32	37			
28	2352		36	42			
29	440		42	44			
30	247		46	49			
31	557		47	50			
SUM	36211	N.A.	-	-	-	-	-
AV.G	1168	N.A.	41	47	N.A.	N.A.	N.A.
NBS ID	Q001		N113			N115	N114

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